

## CLAIMS

What is claimed is:

- 1    1.    A method comprising the computer-implemented steps of:  
2        while an XML processor performs a validation operation on an XML-based input  
3           stream,  
4           causing said XML processor to generate one or more messages that identify  
5           annotations associated with elements in said XML-based input stream.
- 1    2.    The method of Claim 1, further comprising the computer-implemented step of:  
2        while said XML processor performs said validation operation on said XML-based  
3           input stream,  
4           receiving requests for said annotations;  
5           wherein the step of causing said XML processor to generate one or more  
6           messages is performed in response to said requests.
- 1    3.    The method of Claim 2, wherein the step of receiving requests includes receiving a  
2        request via an application program interface through which information about said  
3        validation operation can be requested by an external application.
- 1    4.    The method of Claim 1, wherein the step of causing said XML processor to generate  
2        one or more messages that identify annotations includes causing said XML processor  
3        to generate one or more messages that are transmitted in an output stream.
- 1    5.    The method of Claim 1, wherein the step of causing said XML processor to generate  
2        one or more messages that identify annotations includes causing said XML processor

3 to generate one or more messages before completion of said validation operation on  
4 said XML-based input stream.

1 6. The method of Claim 1,  
2 wherein said validation operation includes performing a validation operation on a first  
3 element of said XML-based input stream; and  
4 wherein the step of causing said XML processor to generate one or more messages  
5 includes causing said XML processor to generate one or more messages that  
6 identify an annotation associated with said first element, only if said first  
7 element is determined valid based on said validation operation on said first  
8 element.

1 7. A computer-readable medium carrying one or more sequences of instructions which,  
2 when executed by one or more processors, causes the one or more processors to  
3 perform the method recited in Claim 1.

1 8. A computer-readable medium carrying one or more sequences of instructions which,  
2 when executed by one or more processors, causes the one or more processors to  
3 perform the method recited in Claim 2.

1 9. A computer-readable medium carrying one or more sequences of instructions which,  
2 when executed by one or more processors, causes the one or more processors to  
3 perform the method recited in Claim 3.

- 1    10.    A computer-readable medium carrying one or more sequences of instructions which,  
2            when executed by one or more processors, causes the one or more processors to  
3            perform the method recited in Claim 4.
- 1    11.    A computer-readable medium carrying one or more sequences of instructions which,  
2            when executed by one or more processors, causes the one or more processors to  
3            perform the method recited in Claim 5.
- 1    12.    A computer-readable medium carrying one or more sequences of instructions which,  
2            when executed by one or more processors, causes the one or more processors to  
3            perform the method recited in Claim 6.
- 1    13.    A method comprising the computer-implemented steps of:  
2            while performing a validation operation on an XML-based input stream,  
3                      receiving a request for information about the state of said validation operation;  
4                      and  
5                      responding to said request by providing said information about said state of  
6                      said validation operation.
- 1    14.    The method of Claim 13, wherein the step of receiving a request includes receiving a  
2            request regarding whether a first element of said XML-based input stream is defined  
3            in corresponding information that dictates the structure of XML data.
- 1    15.    The method of Claim 13, wherein the step of receiving a request includes receiving a  
2            request regarding what data type definition is associated with a first element of said

3 XML-based input stream, wherein said data type is defined in information that  
4 dictates the structure of corresponding XML data.

1 16. The method of Claim 15, wherein the step of receiving a request includes receiving a  
2 request regarding what data type definition is associated with an attribute of said first  
3 element, wherein said data type that is associated with said attribute is defined in said  
4 information that dictates the structure of corresponding XML data.

1 17. The method of Claim 13, wherein the step of receiving a request includes receiving a  
2 request regarding whether a data type of content of a first element of said XML-based  
3 input stream conforms to a corresponding data type definition in information that  
4 dictates the structure of corresponding XML data.

1 18. The method of Claim 13, wherein the step of receiving a request includes receiving a  
2 request regarding a first annotation that is associated with a first element of said  
3 XML-based input stream, wherein said first annotation is defined in information that  
4 dictates the structure of corresponding XML data.

1 19. The method of Claim 18, wherein said information that dictates the structure of  
2 corresponding XML data comprises a second annotation definition that is associated  
3 with a second element of said XML-based input stream, and wherein the step of  
4 receiving a request includes receiving a request regarding said second annotation, the  
5 method further comprising the computer-implemented step of:  
6 before responding to said request regarding said second annotation, responding to a  
7 request regarding whether said first element is defined in said information that  
8 dictates the structure of corresponding XML data.

- 1    20.    The method of Claim 13, wherein the step of receiving a request includes receiving a  
2           request regarding a status of said validation operation with respect to a first element  
3           of said XML-based input stream.
- 1    21.    The method of Claim 13, wherein the step of receiving a request includes receiving a  
2           request via an application program interface through which information about said  
3           validation operation can be requested by an external application.
- 1    22.    The method of Claim 13, wherein the step of receiving a request includes receiving a  
2           request from an event handler sent in response to an event received in a parser output  
3           stream.
- 1    23.    The method of Claim 13, wherein the step of responding to said request includes  
2           providing, in an output stream, said information about the state of said validation  
3           operation.
- 1    24.    The method of Claim 13, further comprising the computer-implemented step of:  
2           parsing said XML-based input stream only once for both of said validation operation  
3           and operations that are dictated by annotations associated with elements in  
4           said XML-based input stream.
- 1    25.    The method of Claim 13, wherein information that dictates the structure of  
2           corresponding XML data in said XML-based input stream, with which said input  
3           stream is validated in said validation operation, comprises a plurality of schema  
4           definitions that are associated with a plurality of corresponding XML documents that  
5           could be constituent to said XML-based input stream.

1    26.    A computer-readable medium carrying one or more sequences of instructions which,  
2            when executed by one or more processors, causes the one or more processors to  
3            perform the method recited in Claim 13.

1    27.    A computer-readable medium carrying one or more sequences of instructions which,  
2            when executed by one or more processors, causes the one or more processors to  
3            perform the method recited in Claim 14.

1    28.    A computer-readable medium carrying one or more sequences of instructions which,  
2            when executed by one or more processors, causes the one or more processors to  
3            perform the method recited in Claim 15.

1    29.    A computer-readable medium carrying one or more sequences of instructions which,  
2            when executed by one or more processors, causes the one or more processors to  
3            perform the method recited in Claim 16.

1    30.    A computer-readable medium carrying one or more sequences of instructions which,  
2            when executed by one or more processors, causes the one or more processors to  
3            perform the method recited in Claim 17.

1    31.    A computer-readable medium carrying one or more sequences of instructions which,  
2            when executed by one or more processors, causes the one or more processors to  
3            perform the method recited in Claim 18.

1    32.    A computer-readable medium carrying one or more sequences of instructions which,  
2            when executed by one or more processors, causes the one or more processors to  
3            perform the method recited in Claim 19.

1 33. A computer-readable medium carrying one or more sequences of instructions which,  
2 when executed by one or more processors, causes the one or more processors to  
3 perform the method recited in Claim 20.

1 34. A computer-readable medium carrying one or more sequences of instructions which,  
2 when executed by one or more processors, causes the one or more processors to  
3 perform the method recited in Claim 21.

1 35. A computer-readable medium carrying one or more sequences of instructions which,  
2 when executed by one or more processors, causes the one or more processors to  
3 perform the method recited in Claim 22.

1 36. A computer-readable medium carrying one or more sequences of instructions which,  
2 when executed by one or more processors, causes the one or more processors to  
3 perform the method recited in Claim 23.

1 37. A computer-readable medium carrying one or more sequences of instructions which,  
2 when executed by one or more processors, causes the one or more processors to  
3 perform the method recited in Claim 24.

1 38. A computer-readable medium carrying one or more sequences of instructions which,  
2 when executed by one or more processors, causes the one or more processors to  
3 perform the method recited in Claim 25.

- 1    39.    A system comprising:  
2           a validator that validates elements and attributes in an XML-based input stream  
3                against information that dictates the structure of corresponding elements and  
4                attributes, said validator comprising  
5                a state machine that responds to requests for information about validating a  
6                first element in said XML-based input stream, while validating said  
7                first element.
- 1    40.    The system of Claim 39, wherein said state machine is able to respond to a request for  
2           information about an annotation associated with said first element, while validating  
3           elements or attributes in said XML-based input stream.
- 1    41.    The system of Claim 39, wherein said state machine is able to respond to a request  
2           that is responsive to an event in a parsed output stream that is based on said XML-  
3           based input stream.